

**What is claimed is:**

1. An immunogenic composition comprising:  
a modified live Bovine Herpes Virus (BHV-1);  
a modified live parainfluenza virus Type 3 (PI3);  
a modified live Bovine Respiratory Syncytial Virus (BRSV);  
an adjuvant;  
at least one antigen; and  
a veterinary-acceptable carrier.
2. The immunogenic composition of Claim 1, wherein said antigen is inactivated.
3. The immunogenic composition of Claim 1, wherein said adjuvant comprises a saponin.
4. The immunogenic composition of Claim 3, wherein said adjuvant comprises saponin containing oil-in-water emulsion.
5. The immunogenic composition of Claim 4, wherein said adjuvant comprises Quil A, Amphigen and cholesterol.
6. The immunogenic composition of Claim 5, wherein said Quil A, Amphigen and cholesterol oil-in-water emulsion is microfluidized.
7. The immunogenic composition of Claim 1, wherein said antigen comprises at least one antigen selected from the group consisting of Bovine Viral Diarrhea Virus (BVDV-1), Bovine Viral Diarrhea Virus (BVDV-2), *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira borgpetersenii hardjo-prajitno*, *Leptospira icterohaemorrhagiae*, *Leptospira interrogans pomona*, *Leptospira borgpetersenii hardjo-bovis*, and *Campylobacter fetus*.
8. The immunogenic composition of Claim 7, wherein said Bovine Viral Diarrhea Virus (BVDV-1) is cytopathic.
9. The immunogenic composition of Claim 7, wherein said Bovine Viral Diarrhea Virus (BVDV-1) is noncytopathic.
10. The immunogenic composition of Claim 7, wherein said Bovine Viral Diarrhea Virus (BVDV-2) is cytopathic.

11. The immunogenic composition of Claim 7, wherein said Bovine Viral Diarrhea Virus (BVDV-2) is noncytopathic.
12. A method of inducing an immune response against Bovine Herpes Virus Type 1 in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinarly-acceptable carrier.
13. A method of inducing an immune response against Bovine Viral Diarrhea Virus Type- 1 in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinary-acceptable carrier.
14. A method of inducing an immune response against Bovine Viral Diarrhea Virus Type- 2 in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinary-acceptable carrier.
15. A method of inducing an immune response against parainfluenza virus Type 3 (PI3) in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinary-acceptable carrier.
16. A method of inducing an immune response against Bovine Respiratory Syncytial Virus (BRSV) in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinary-acceptable carrier.
17. A method of inducing an immune response against *Campylobacter fetus* in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinary-acceptable carrier.
18. A method of inducing an immune response against an antigen selected from the group consisting of *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira borgpetersenii hardio-prajitno*, *Leptospira icterohaemorrhagia*, *Leptospira interrogans pomona*, *Leptospira borgpetersenii hardjo-bovis*, *Leptospira bratislava*, *Neospora caninum*, *Trichomonas fetus*, *Mycoplasma bovis*, *Haemophilus somnus*, *Mannheimia haemolytica* and *Pasturella multocida* in an animal subject, comprising administering an immunologically effective amount of the composition of Claim 1 and a veterinary-acceptable carrier.
19. The method of any one of claims 12-18, wherein said immune response is a cellular or humoral immune response.
20. A vaccine composition comprising:

- a modified live Bovine Herpes Virus (BHV-1);  
a modified live parainfluenza virus Type 3 (PI3);  
a modified live Bovine Respiratory Syncytial Virus (BRSV);  
an adjuvant;  
at least one antigen; and  
a veterinarian-acceptable carrier.
21. The vaccine composition of Claim 20, wherein said antigen is inactivated.
  22. The vaccine composition of Claim 20, wherein said adjuvant comprises a saponin.
  23. The vaccine composition of Claim 20, wherein said adjuvant comprises saponin containing oil-in-water emulsion.
  24. The vaccine composition of Claim 23, wherein said saponin containing oil-in-water emulsion is microfluidized.
  25. The vaccine composition of Claim 20, wherein said adjuvant comprises Quil A, Amphigen and cholesterol.
  26. The vaccine composition of Claim 25, wherein said Quil A, Amphigen and cholesterol, oil-in-water emulsion is microfluidized.
  27. The vaccine composition of Claim 20, wherein said antigen comprises at least one antigen selected from the group consisting of Bovine Viral Diarrhea Virus (BVDV-1), Bovine Viral Diarrhea Virus (BVDV-2), *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira borgpetersenii hardjo-prajitno*, *Leptospira icterohaemorrhagiae*, *Leptospira interrogans pomona*, *Leptospira borgpetersenii hardjo-bovis* and *Campylobacter fetus*.
  28. The vaccine composition of Claim 27, wherein said Bovine Viral Diarrhea Virus (BVDV-1) is cytopathic.
  29. The vaccine composition of Claim 27, wherein said Bovine Viral Diarrhea Virus (BVDV-1) is noncytopathic.
  30. The vaccine composition of Claim 27, wherein said Bovine Viral Diarrhea Virus (BVDV-2) is cytopathic.
  31. The vaccine composition of Claim 27, wherein said Bovine Viral Diarrhea Virus (BVDV-2) is noncytopathic.

32. A method of preventing abortion caused by a virus selected from the group consisting of BHV-1 in an animal comprising administering to said animal a therapeutically effective amount of the vaccine composition of Claim 20.
33. The method of Claim 32, wherein said animal is a cow, a calf, a heifer, a steer or a bull.
34. The method of Claim 33, wherein said animal is a lactating cow.
35. The method of Claim 33, wherein said animal is a pregnant cow.
36. The method of Claim 33, wherein said animal is a prebreeding cow or heifer.
37. The method of Claim 32, wherein said vaccine is administered intramuscularly.
38. The method of Claim 32, wherein said vaccine is administered subcutaneously.
39. The method of Claim 32, wherein said vaccine contains from about  $10^3$  to about  $10^{10}$  colony forming units per dose of each virus.
40. The method of Claim 32, wherein the amount of said vaccine administered is from about 0.5 to about 5.0ml per dose.
41. The method of Claim 32, wherein the amount of said vaccine administered is about 5ml per dose.
42. The method of Claim 32, wherein the amount of said vaccine administered is about 2 ml per dose.
43. A method of treating or preventing a disease or disorder in an animal caused by infection with a virus selected from the group consisting of BVDV Type 1 or Type 2, BHV-1, PI3 or BRSV comprising administering to said animal a therapeutically effective amount of the vaccine composition of Claim 20.
44. The method of Claim 43, wherein said animal is a cow, a calf, a heifer, a steer or a bull.
45. The method of Claim 44, wherein said animal is a lactating cow.
46. The method of Claim 44, wherein said animal is a prebreeding cow or heifer.
47. The method of Claim 44, wherein said animal is a pregnant cow.

48. The method of Claim 43, wherein said vaccine is administered intramuscularly.
49. The method of Claim 43, wherein said vaccine is administered subcutaneously.
50. The method of Claim 43, wherein said vaccine contains from about  $10^3$  to about  $10^{10}$  colony forming units per dose.
51. The method of Claim 43, wherein the amount of said vaccine administered is from about 0.5 to about 5.0ml per dose.
52. The method of Claim 51, wherein the amount of said vaccine administered is about 5ml per dose.
53. The method of Claim 51, wherein the amount of said vaccine administered is about 2ml per dose.
54. A method of treating or preventing a disease or disorder in an animal caused by infection with an antigen selected from the group consisting *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira borgpetersenii hardio-prajitno*, *Leptospira icterohaemorrhagiae*, *Leptospira interrogans pomona*, *Leptospira borgpetersenii hardjo-bovis*, *Leptospira Bratislava*, *Campylobacter fetus*, *Neospora caninum*, *Trichomonas fetus*, *Mycoplasma bovis*, *Haemophilus somnus*, *Mannheimia haemolytica* and *Pasteurella multocida*, comprising administering to said animal a therapeutically effective amount of the vaccine composition of Claim 20.
55. The method of Claim 54, wherein said animal is a cow, a calf, a heifer, a steer or a bull.
56. The method of Claim 55, wherein said animal is a lactating cow.
57. The method of Claim 55, wherein said animal is a pregnant cow.
58. The method of Claim 55, wherein said animal is a prebreeding cow or heifer.
59. The method of Claim 54, wherein said vaccine is administered intramuscularly.
60. The method of Claim 54, wherein said vaccine is administered subcutaneously.
61. The method of Claim 54, wherein said vaccine contains from about  $10^3$  to about  $10^{10}$  colony forming units per dose of each virus.

62. The method of Claim 54, wherein the amount of said vaccine administered is from about 0.5 to about 5.0ml per dose.
63. The method of Claim 62, wherein the amount of said vaccine administered is about 5ml per dose.
64. The method of Claim 62, wherein the amount of said vaccine administered is about 2ml per dose.
65. A method of preventing persistent fetal infection in an animal subject, comprising administering to said animal an effective amount of the vaccine composition of Claim 20.
66. The method of Claim 65, wherein said animal is a cow, a calf, a heifer, a steer or a bull.
67. The method of Claim 66, wherein said animal is a lactating cow.
68. The method of Claim 66, wherein said animal is a pregnant cow.
69. The method of Claim 66, wherein said animal is a prebreeding cow or heifer.
70. The method of Claim 66, wherein said vaccine is administered intramuscularly.
71. The method of Claim 66, wherein said vaccine is administered subcutaneously.
72. The method of Claim 66, wherein said vaccine contains from about  $10^3$  to about  $10^{10}$  colony forming units per dose of each virus.
73. The method of Claim 65, wherein the amount of said vaccine administered is from about 0.5 to about 5.0ml per dose.
74. The method of Claim 73, wherein the amount of said vaccine administered is about 5ml per dose.
75. The method of Claim 73, wherein the amount of said vaccine administered is about 2ml per dose.
76. A vaccine composition comprising:
  - a modified live Bovine Herpes Virus (BHV-1);
  - a modified live parainfluenza virus Type 3 (PI3);
  - a modified live Bovine Respiratory Syncytial Virus (BRSV);

a cytopathic BVD-2;

a BVD-1;

an adjuvant;

at least one antigen selected from the group consisting of *Leptospira canicola*, *Leptospira grippotyphosa*, *Leptospira borgpetersenii hardio-prajitno*, *Leptospira icterohaemorrhagia*, and *Leptospira interrogans pomona*, *Leptospira borgpetersenii hardjo-bovis*, *Leptospira Bratislava* and *Campylobacter fetus*; and

a veterinary-acceptable carrier.

77. The vaccine composition of Claim 76, wherein said adjuvant comprises saponin containing oil-in-water emulsion.

78. The vaccine composition of Claim 76, wherein said saponin containing oil-in-water emulsion is microfluidized.

79. The vaccine composition of Claim 76, wherein said adjuvant comprises Quil A, Amphigen and cholesterol.

80. The vaccine composition of Claim 76, wherein said cytopathic BVD-2 is inactivated.

81. The vaccine composition of Claim 76, wherein said BVD-1 is cytopathic.

82. The vaccine composition of Claim 76, wherein said cytopathic BVD-1 is inactivated.

83. The immunogenic composition of Claim 4, wherein said saponin containing oil-in-water emulsion is microfluidized.